



## USER MANUAL

# *SixTRAK* I/O Controller / RTU

## Installation and Maintenance



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This manual applies to the following Sixnet products:  
**ST-GT-####**

## ***PROTECTED TECHNOLOGY POLICY***

Sixnet protects your investment in Sixnet systems with long-term planned technology and our unique Protected Technology Policy. We will continue to support the specified capabilities of standard Sixnet products for at least five years. We plan each product improvement and new feature to be upward compatible with existing designs and installations. Our goals are to make each new software release bring new power to your Sixnet systems and have every existing feature, applications program and data file continue to work.

We protect your investment even further with a liberal five-year trade-in policy. Exchange standard products for upgraded versions of the same product to take advantage of new features and performance improvements at any time for five years. A prorated trade-in allowance will be given for your existing equipment.

Sixnet protects your long-term productivity with state-of-the-art planned technology and continued support.

## ***STATEMENT OF LIMITED WARRANTY***

Sixnet, manufacturer of SixTRAK, VersaTRAK, RemoteTRAK and EtherTRAK products, warrants to Buyer that products manufactured by Sixnet will be free from defects in material and workmanship. Sixnet's obligation under this warranty will be limited to repairing or replacing, at Sixnet's option, the defective parts within 1 year of the date of installation, or within 18 months of the date of shipment from the point of manufacture, whichever is sooner. Products may be returned by Buyer only after permission has been obtained from Sixnet. Buyer will prepay all freight charges to return any products to the repair facility designated by Sixnet.

This limited warranty does not cover losses or damages that occur in shipment to or from Buyer or due to improper installation, maintenance, misuse, neglect or any cause other than ordinary commercial or industrial applications. This limited warranty is in lieu of all other warranties whether oral or written, expressed or implied. Sixnet's liability shall not exceed the price of the individual unit which is the basis of the claim. In no event shall Sixnet be liable for any loss of profits, loss of use of facilities or equipment or other indirect, incidental or consequential damages.

## ***INSTALLATION AND HAZARDOUS AREA WARNINGS***

These products should not be used to replace proper safety interlocking. No software-based device (or any other solid-state device) should ever be designed to be responsible for the maintenance of consequential equipment or personnel safety. In particular, Sixnet disclaims any responsibility for damages, either direct or consequential, that result from the use of this equipment in any application.

All power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods and in accordance with the authority having jurisdiction.

**WARNING – EXPLOSION HAZARD – SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.**

**WARNING – EXPLOSION HAZARD – WHEN IN HAZARDOUS LOCATIONS, DISCONNECT POWER BEFORE REPLACING OR WIRING MODULES.**

**WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.**

|   |
|---|
| <p><b>Note:</b> All information in this document applies to SixTRAK I/O Controller except where otherwise noted. Refer to the Sixnet I/O Tool Kit software online help system for detailed product specifications and configuration settings.</p> |
|---|

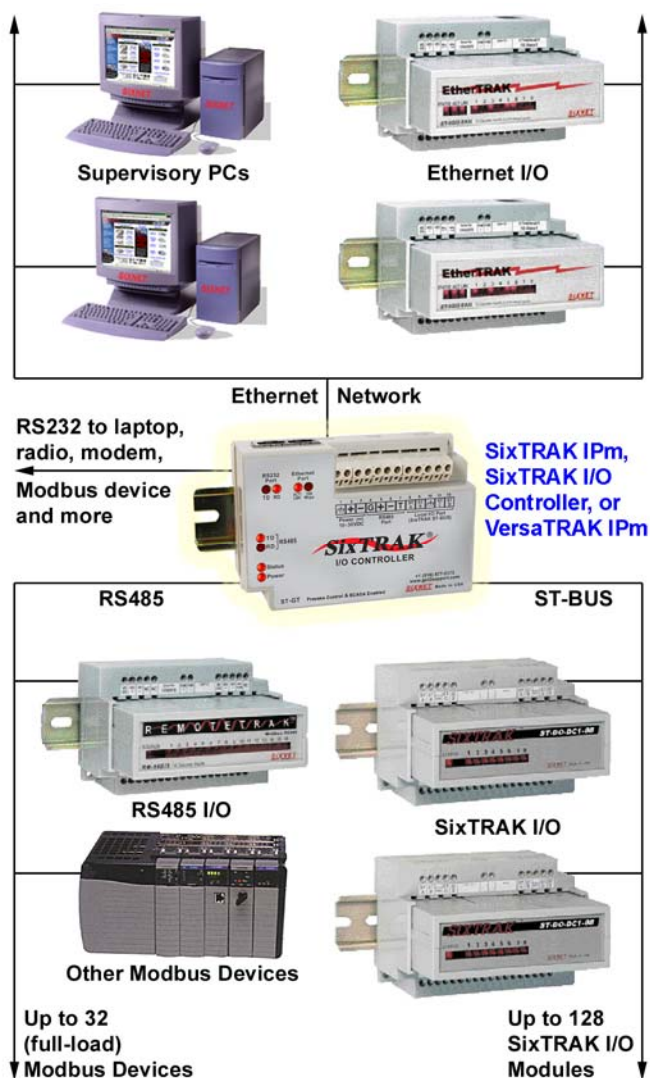
## Section 1

## Overview

### Introduction

The products covered by this manual are designed for use in industrial control and data acquisition systems. Refer to the Sixnet Electronic catalog and the individual data sheets for complete features and benefits. This user manual covers the aspects of hardware installation and maintenance. For software features and capabilities please refer to Sixnet's Electronic help System accessible from within the Sixnet I/O Tool Kit software.

A typical Sixnet station consists of an AC to DC power supply; a Sixnet controller or RTU; and modular I/O modules. The I/O modules can be interfaced via Ethernet (EtherTRAK), RS485 (RemoteTRAK), or the ST-BUS (SixTRAK). Just about any combination of these components along with third party hardware and software can be used to make a system.



**These Sixnet products offer practically unlimited I/O expansion and communication connectivity.**



## SixTRAK I/O Controller / RTU ST-GT-####

### Sixnet Products Covered by this Manual

#### Sixnet Software Tools



#### Sixnet I/O Tool Kit

Sixnet supplies the "mission oriented" tools you need for every step of your project from the initial specification, through startup, and years of trouble free operation. Configuration information flows between Sixnet Windows, saving you time (you don't have to enter data multiple times) and dramatically reducing data entry errors. Refer to the on-line help in the Sixnet I/O Tool Kit for complete details.

The Sixnet I/O Tool Kit is a configuration, calibration and maintenance tool for Sixnet hardware. Use the I/O Tool Kit to configure I/O features, perform channel-by-channel calibrations in meaningful engineering units, and perform live diagnostics at each station. Refer to the electronic help for details.

Here are the optional Feature Sets for the Sixnet I/O Tool Kit:

#### SCS (Scalable Control System) features

Includes importing, tag exporting, I/O transfers, advanced load options, and the IOMap shared database. The SCS option is required to develop ISaGRAF programs, using the ISaGRAF Workbench.

#### Datalogging

Includes Sixlog datalogging including automatic host and client transfers.

#### Open LINUX features (applies to LINUX IPm units only)

Gain access to LINUX-visible features in IPm controllers, including file loading and advanced diagnostics. A library of functions to access the IPm I/O registers and other services is supplied with this enhanced license.

#### Web Server Access (applies to LINUX IPm units only)

IPm controllers contain an internal web page that reports status information. Obtain a license to load customizations to this web page.



#### Sixlog

Sixlog is datalogging software for Sixnet controllers or RTUs. Data is logged into protected memory in the unit. Then Sixlog uploads the data files and saves them into ASCII format files that are easy to import into databases, spreadsheets and other Windows applications. Access the Sixlog functions from within the Sixnet I/O Tool Kit.



#### ISaGRAF

The ISaGRAF Workbench allows you to write an IEC 61131 control program for a Sixnet controller or RTU. All 5 of the IEC 61131 languages are supported, including Ladder Logic and Function Blocks.

Following these steps will make installation and start-up easier.

### ① Mount the Hardware

If you purchased a TrakPak packaged system, the complete enclosure is ready for installation on any flat surface. If you purchased individual components, refer to the following sections of this or the appropriate user manuals for information on installing them into an enclosure.

### ② Install ST-BUS or Communication Wiring to I/O Modules

Make ST-BUS wiring connections to any SixTRAK I/O modules. Refer to a following section for ST-BUS wiring guidelines. Make the necessary communication connections to any EtherTRAK or RemoteTRAK I/O modules. If you have a TrakPak packaged system, all these connections have already been done for you.

### ③ Connect Power and I/O Wiring to the Modules

Connect AC power to the Sixnet or user supplied power supply. Make DC power connections from the power supply to the Sixnet components. Make field wiring connections to the Sixnet I/O modules and any peripheral equipment. Refer to the appropriate user manuals for I/O connection details.

### ④ Install Communication Cabling

The units covered by this manual come with communication accessories. Snap the pre-wired RJ45 to DB9 adapter to the RJ45 patch cord (not supplied). Connect this cable between one of the serial RS232 ports (RJ45 connector) on your controller or RTU and a serial RS232 port (DB9 connector) on your PC.

Fabricate and install RS232 and RS485 cables as needed to connect to other devices. If you are using Ethernet units, install the correct cabling and peripherals. Refer to the documentation for your Ethernet communication devices for details.

### ⑤ Apply Power

Power up the Sixnet components and related peripherals. Observe the status LED on each unit. Typically a solid ON indicates proper operation. A blinking LED may indicate that the unit needs to be configured. Refer to the appropriate Sixnet user manual for details.

### ⑥ Configure Using the Sixnet I/O Tool Kit

Refer to the steps on the next page to create a hardware configuration for each **Sixnet** station. Refer to the on-line help in the I/O Tool Kit for details.

### ⑦ Test the Hardware

Use the Test I/O window in the I/O Tool Kit program to verify proper I/O operation of all **Sixnet** stations. Refer to the I/O Tool Kit on-line help system.

### ⑧ Configure Your PC Software to Communicate with the Sixnet station(s)

Refer to the documentation for your software.

### ⑨ If You Have Difficulty

If you experience startup trouble, refer to a following page in this document for some troubleshooting tips or go to [www.sixnet.com](http://www.sixnet.com). If you still need assistance then please contact Sixnet.

## Using Sixnet Windows Software



Below is a quick overview of using the Sixnet I/O Tool Kit. It is supplied on the Sixnet CD and registering for Level 1 (basic features) is free.

**Note:** An expanded version of this page has been provided as on-line help. To access it, click on the Getting Started icon in the I/O Tool Kit online help.

**Basic Configuration:** Run the Sixnet I/O Tool Kit program and create your panel layouts. Then configure operating parameters for each Sixnet component, including channel tag names. Link the SixTRAK I/O modules (if any) and load your configuration to the controller or RTU. Assign virtual I/O modules and I/O transfers for any EtherTRAK or RemoteTRAK modules you wish to have the controller or RTU poll. Save this information to a project file. Using the Test I/O function, verify that you can read and write all your I/O.

**Note:** Set tag name restrictions in the Sixnet I/O Tool Kit program before creating tag names to ensure compatibility when exporting them for usage in other Windows applications.

Your Sixnet components are now ready to exchange I/O data with your Windows applications via DDE, OPC, or direct DLL calls. (Refer to the "How to Access Sixnet I/O From a Windows Application" topic in the Sixnet I/O Tool Kit online help.) If you will be running a Windows application, then continue with the following steps.



**Exporting I/O Definitions:** (optional, requires the SCS feature set) Some Windows applications, such as ISaGRAF, Citect and Intellution FIX, can import Sixnet tag names. If your Windows application supports this feature, run the Sixnet I/O Tool Kit and open your project file. Export your tag names to a file using the appropriate format.

**Note:** If you are exporting tag names for ISaGRAF, Citect or Intellution, you must create, or already have, a project to export tag data into.



**Datalogging:** (optional, requires the Datalogging feature set) If you will be logging data in the Sixnet controller or RTU, then create the appropriate datalog configuration(s) and load them into the unit. Refer to the Sixlog topics in the Sixnet I/O Tool Kit online help for details.



**IEC 61131 Programming:** (optional, requires the SCS feature set) If you are using the ISaGRAF IEC1131 programming software, refer to the Sixnet ISaGRAF on-line help for detailed instructions.

## Section 2

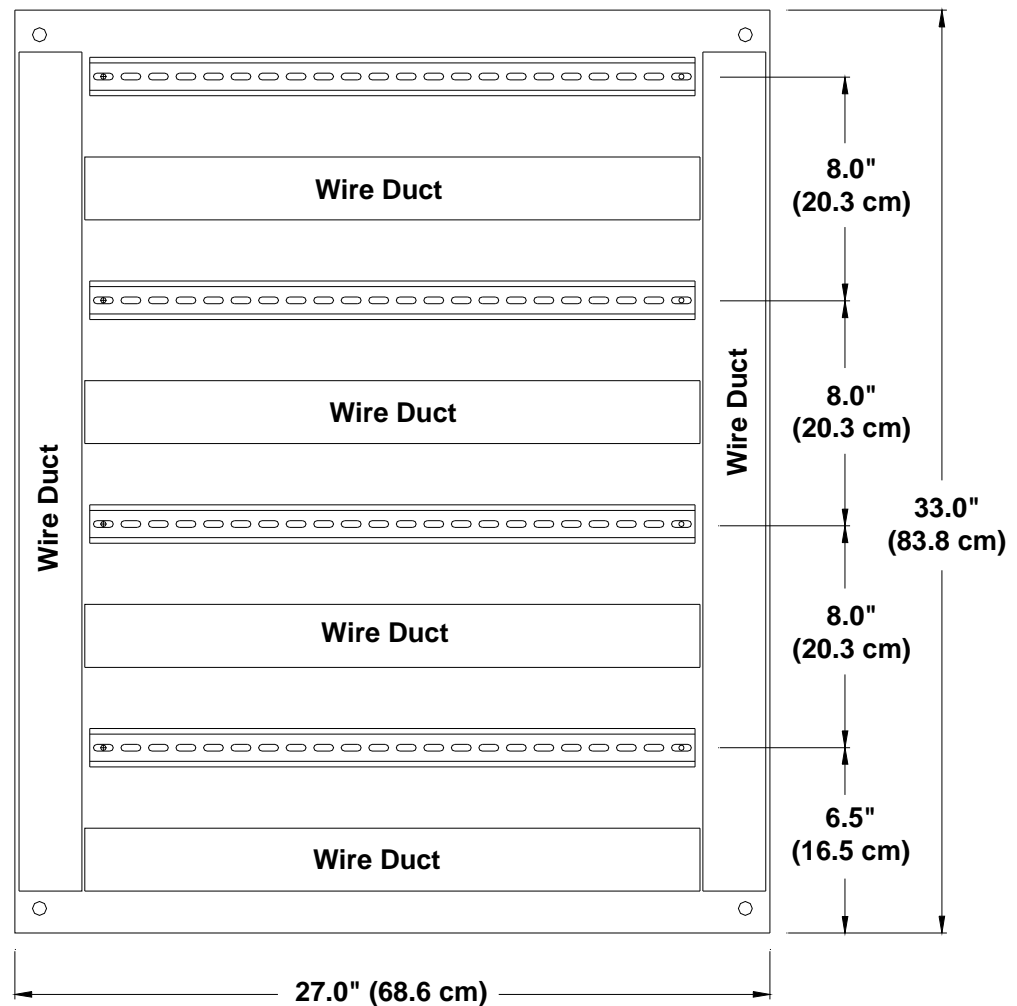
### SixTRAK Panel Assembly

## Assembly and Installation

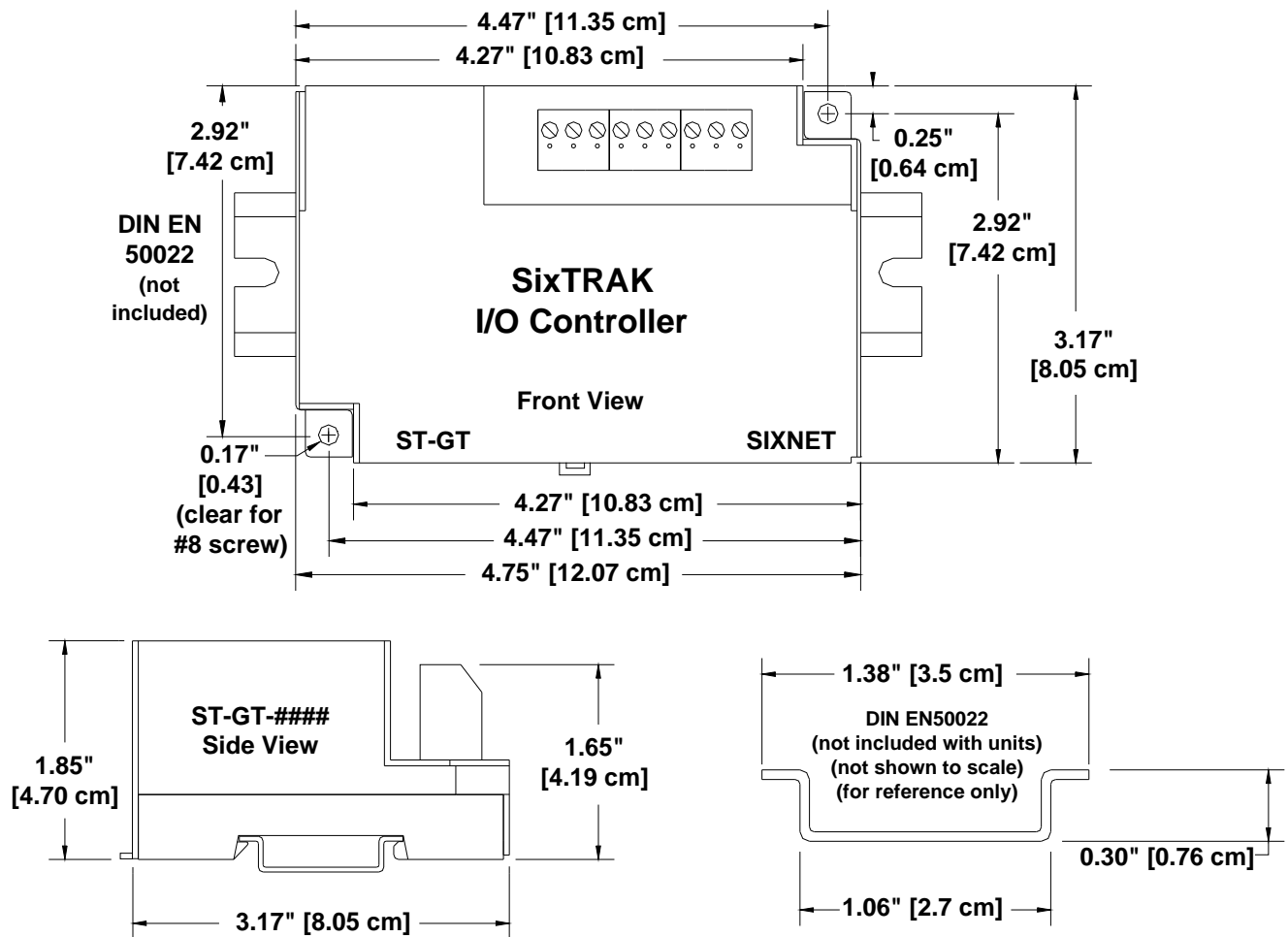
Most Sixnet components snap onto DIN rail strips fastened to a subpanel. Figure 2-1 shows a sample panel with DIN rail strips and wire duct attached. Recommended DIN rail spacing is 8 inches. This spacing allows room for wire duct to be installed without obstructing field wiring installation.

The Sixnet components are typically installed against one another, but space may be left between modules to accommodate other DIN rail mounted components such as terminal blocks and fuse holders. End clamps are recommended to restrict side-to-side movement. Figure 2-2 shows the physical dimensions of the units covered by this manual.

Sixnet components can be installed in any orientation and order on your panel.



Sample Layout For a 36" x 30" Enclosure  
(Figure 2-1)



**SixTRAK I/O Controller / RTU  
Dimensions  
(Figure 2-2)**



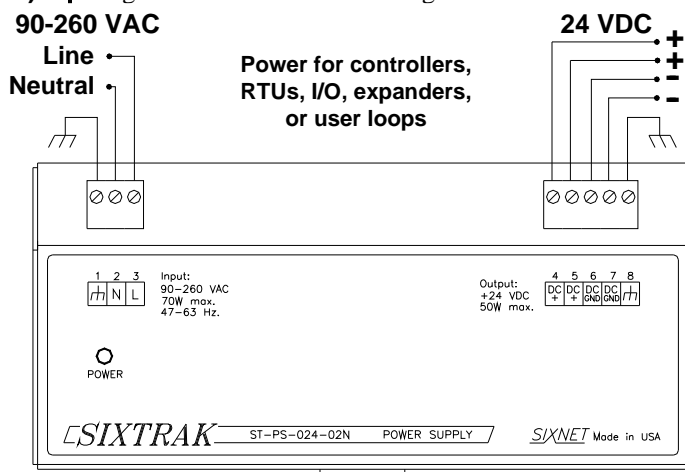
## Section 3 Power and ST-Bus Wiring

### Power Requirements

#### ST-PS-024-02N (24VDC @ 2A)

Sixnet controllers and RTUs accept 24 VDC power from a Sixnet power supply (ST-PS-024-02N or RM-PS-024-01F) or from a user DC power source of **10 to 30 VDC**.

The optional SixTRAK power supply operates on 90 to 260VAC (47 to 63 Hz.). Refer to Figure 3-1 for connections. Tighten these screw terminals to a maximum of 3.48 in.-lbs.

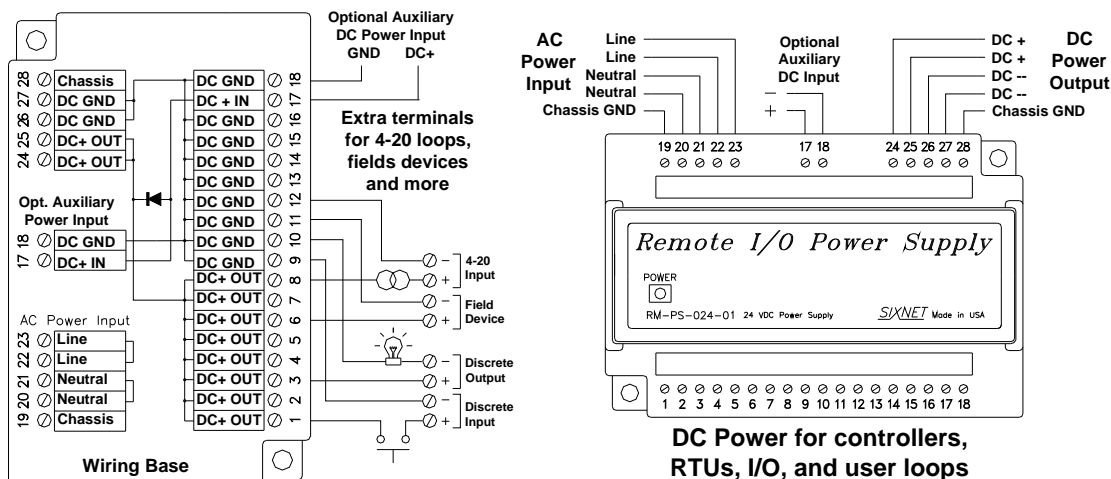


**ST-PS-024-02N  
Power Connections**

(Figure 3-1)

#### RM-PS-024-01F (24VDC @ 1A)

The optional RM-PS-024-01F operates on 85-264 VAC (47-63 Hz) or 120-370 VDC. Refer to Figure 3-2 for connections. Tighten the screw terminals to a maximum of 3.48 in.-lbs.



**RM-PS-024-01F Power Connections**

(Figure 3-2)

#### RM-PS-024-01F Redundant Power

The RM-PS-024-01F allows you to connect auxiliary 24 VDC power (from another RM-PS-024-01F or other source) to terminals 17 and 18. When auxiliary power is connected, the RM-PS-024-01F will source most of the power, under normal operating conditions. If the primary power fails then the auxiliary power will immediately take over.

### Current Requirements

To calculate the current requirements, add the wattage required for the Sixnet controller or RTU, and modules in use. Then divide the total wattage by the DC power source voltage. Then add any current needed for user instrumentation loops.

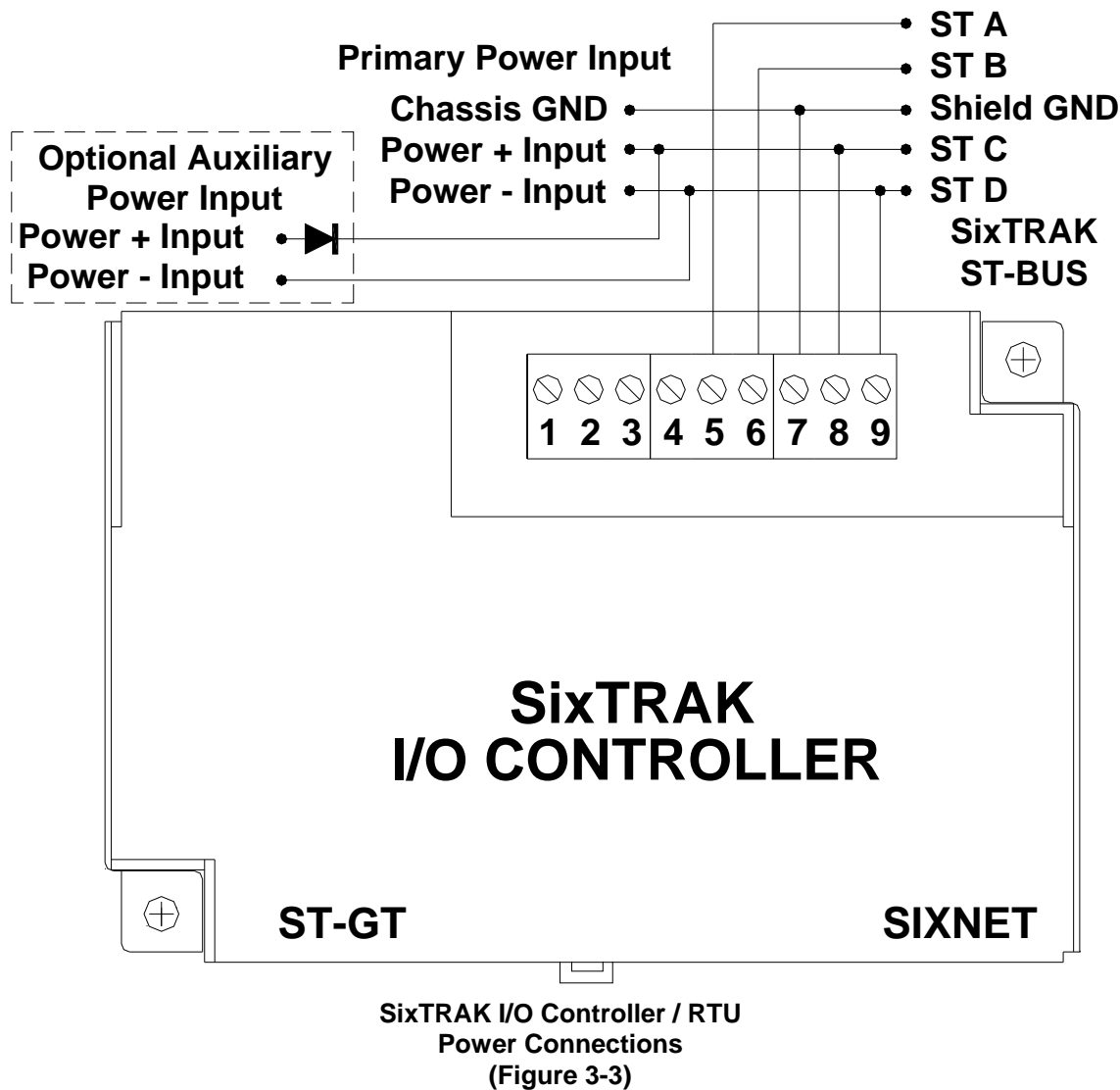
## DC Power Wiring

All Sixnet units and user instrumentation loops may be powered from a single DC source. Refer to Figure 3-3 for typical DC power connections. The user DC power source must be between **10 to 30 volts**.

## Redundant Power Inputs

The SixTRAK I/O Controller / RTU can have redundant power inputs but requires an externally wired diode. The diode should be appropriately sized (current rating) for the number of SixTRAK I/O modules being powered. This allows you to connect two separate power supplies. If one fails then the other will take over supplying power. See figure 3-3.

**Note:** Though the SixTRAK I/O Controller /RTU can run on 10-30 VDC, the SixTRAK I/O modules require power in the range of 18-30 VDC. 24 VDC is recommended.



## ST-Bus Wiring Guidelines

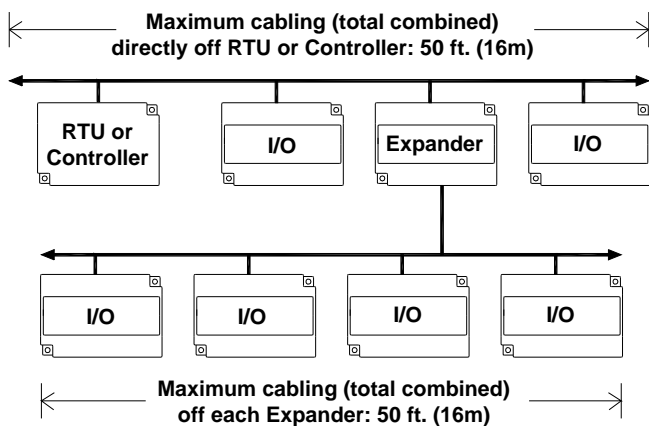
### ST-Bus Capability

ST-Bus wiring connects the SixTRAK I/O modules and expanders to the controller / RTU. Follow the upcoming guidelines for reliable performance.

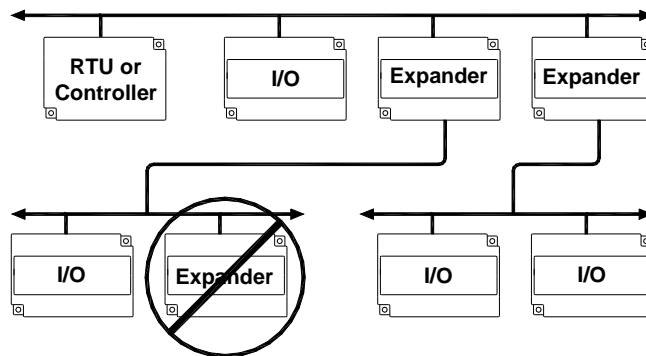
|   |  |
|---|--|
| Max. modules controlled by one controller / RTU.....                  | 128  |
| Max. modules or expanders connected directly to controller / RTU..... | 20 (any mix)                                       |
| Max. modules connected to expander output.....                        | 20 (any mix)                                       |
| Required cable type.....  | Any with 2 individually shielded pairs, 22AWG min. |
| Recommended cables.....   | Alpha 2466C, Belden 8723, Carol C1352              |
| Max. cabling off each controller / RTU or expander .....              | 50 ft. (16M)                                       |

## ST-EX-001-20U I/O Expander

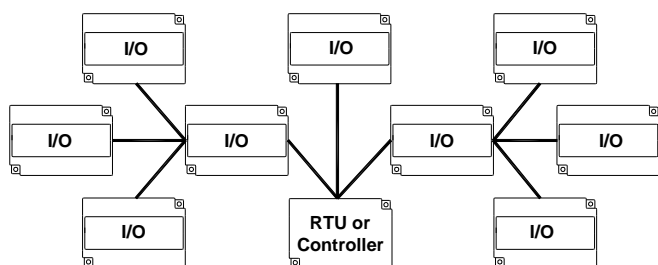
See the SixTRAK I/O User manual for details on using the ST-EX-001-20U I/O expander.



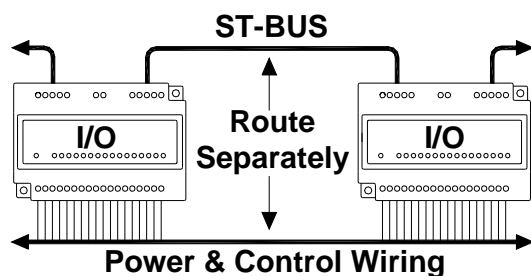
Connect up to 20 I/O modules or expanders directly to the controller / RTU with a maximum total cabling of 50 feet. Likewise, connect up to 20 I/O modules to each expander.



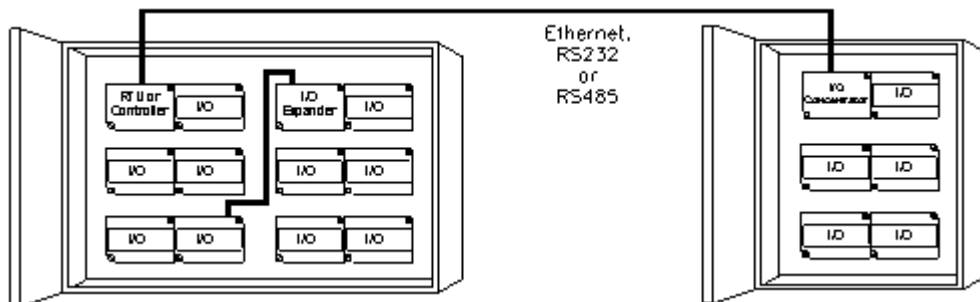
All expanders must be connected directly to the controller / RTU. (Expanders cannot be cascaded in series.)



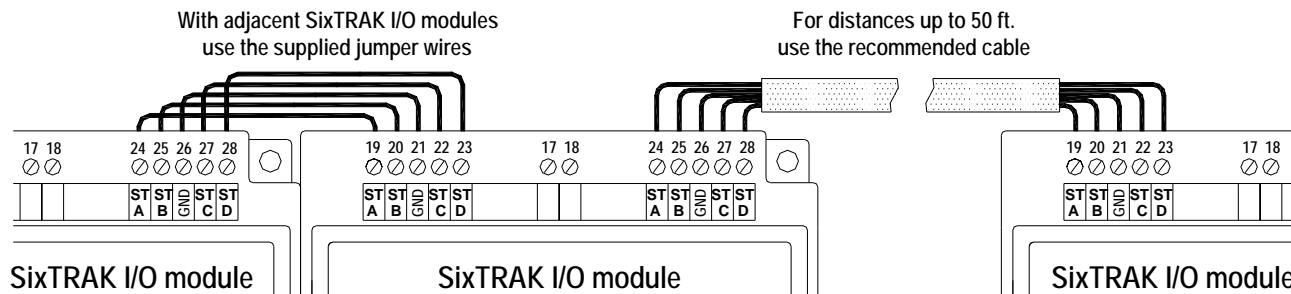
ST-Bus connections may form star configurations without any restrictions.



Route ST-Bus wiring away from power wiring and sources of electrical interference.



Expanders may be used in cabinets with more than 20 I/O modules as long as the total length of wire stays within the 50-foot limit. Extending ST-Bus wiring to additional cabinets is not recommended. Instead, use a gateway, RTU or I/O concentrator in each additional cabinet and run Ethernet, RS232 or RS485 wiring between the cabinets.



Use the supplied ST-Bus jumpers between adjacent SixTRAK components. Otherwise, use the recommended cable.

## Section 4

## Communications

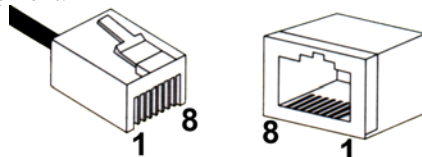
### Communication ports

#### RS232 Port (Port B)

The Sixnet I/O Controller / RTU covered by this manual has the following Ethernet and serial ports.

| Product    | RS232 Port A | RS232 Port B | RS485 Port C | RS232 Port D | Ethernet Port 1 | Ethernet Port 2 | Built-in Switch |
|------------|--------------|--------------|--------------|--------------|-----------------|-----------------|-----------------|
| ST-GT-#### | -            | X            | X            | -            | X               | -               | -               |

A RJ45 female connector is provided on the unit. The pin-outs follow the EIA/TIA-561 standard (See figure 4-1). A pre-wired DB9F to RJ45F adapter is included with these units. Use this adapter along with a RJ45 male to RJ45 male straight-thru wired patch cable (not included) to make a connection between a com port on your PC (DB9 male) and Port B (RJ45 female). Refer to the Sixnet Electronic catalog for more information on connecting to other equipment.



**RJ45 Pin Locations  
(for RS232 or Ethernet)**

#### RS485 Port (Port C)

This port is found on all units. It provides a RS485 (2-wire, half duplex only) connection to Sixnet's RemoteTRAK I/O modules or other equipment. Four terminals (for signal gnd, 485+, 485-, & termination) are provided. Generally, you connect + to + and - to - between units. However, since there is no standard for RS485 terminal designations you may need to connect + to - and - to + in some cases. No damage will result if you connect incorrectly. It is highly recommended that you tie the signal ground to an appropriate ground (if available) between all RS485 units. Make sure to use a good quality communication cable with three conductors (twisted is preferred) plus a shield. To prevent ground loops, the shield should be connected to chassis ground on only one end of any cable run.

**Note:** If you have existing wiring that has only two conductors and a shield, you can use the shield to connect the signal grounds between stations. This is not optimal (especially for long cable runs) but should work in most situations.

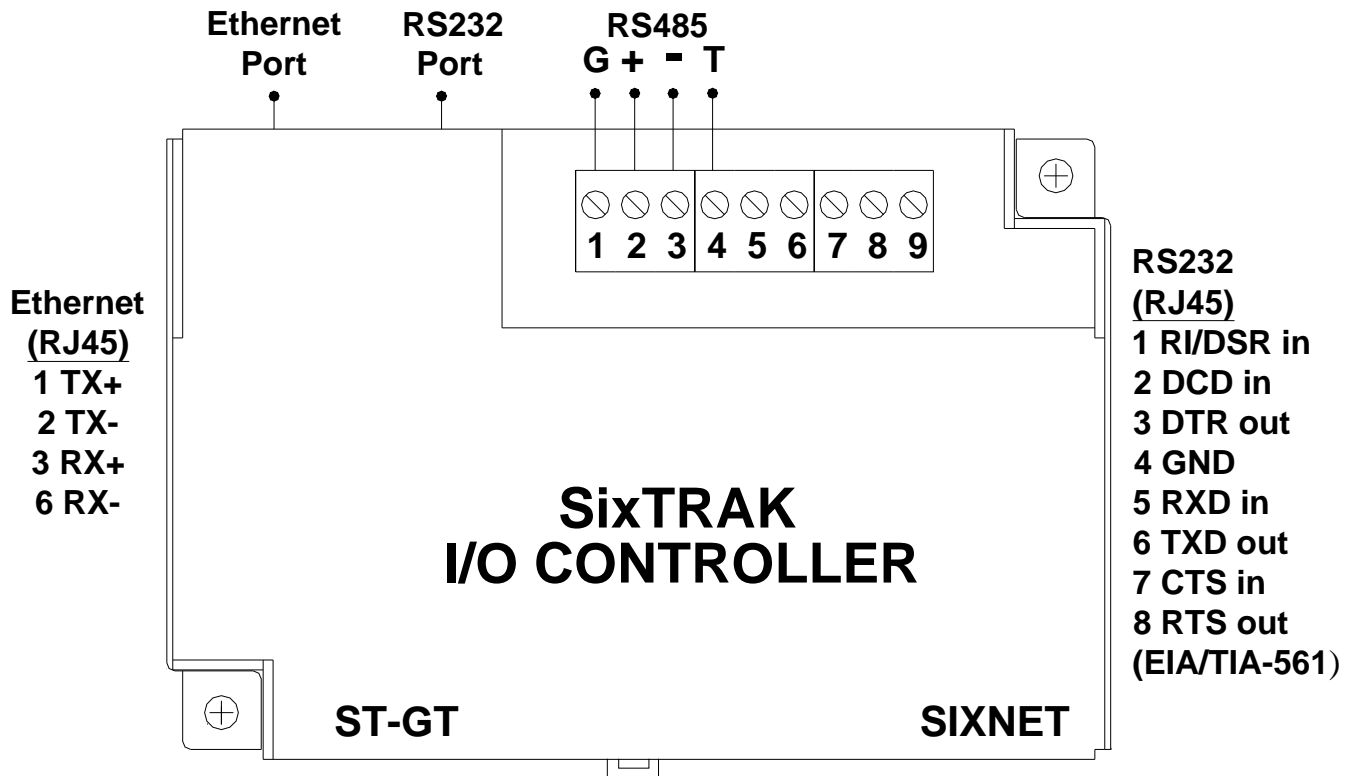
**RS485 Termination:** All these units have RS485 termination components (150 ohm resistor and a 0.1  $\mu$ F capacitor connected in series) already inside. To terminate your RS485 network just tie the "T" terminal to the RS485 - terminal. Make sure to use the same type and size conductor as used already used for your RS485 - connection. It is recommended that both end stations of your RS485 network be terminated. Avoid terminating more than two stations. Refer to the RemoteTRAK I/O User Manual on how to terminate a RemoteTRAK I/O Module. For 3<sup>rd</sup> party devices, please refer to their user manual for termination instructions.

**Bias Resistors:** On a RS485 2-wire network, a pair of bias resistors (1K ohm typically) acting upon the transmit/receive wires may be required. If bias resistors are not present, the receive inputs on some RS485 devices may react to noise on the floating wires. The bias resistors will force the transmit/receive wires to a known (non-floating) state when none of the RS485 devices are transmitting data. Some RS485 devices have bias resistors built-in, and are enabled through DIP-switch or jumper settings. Make sure there is only one pair of bias resistors acting upon the network.

**Note:** If your RS485 network is made up exclusively of Sixnet devices then these bias resistors are not necessary.

## Ethernet Port

This port is found on all units. It is a 10/100BaseTx auto-detecting and auto-crossover Ethernet port. This means it will auto-detect the speed, and work with either a straight-thru or cross-wired Ethernet cable. A standard shielded RJ45 connector is provided. See the figure below for the pin-outs. This port has a fixed unique MAC address. The IP address can be set with the Sixnet I/O Tool Kit software. Refer to the on-line help for details.



SixTRAK I/O Controller / RTU  
Communication Connections  
(Figure 4-1)

## Section 5 Technical Specifications

### Technical Specifications

Here are the technical specifications for the SixTRAK I/O Controller / RTU.

|  |   |
|--|---|
| General  | Industrial PowerPC (32 bit data bus)  |
| Compatibility with legacy VersaTRAK RTU and SixTRAK Programmable I/O Gateway               | Fully (except there is no on-board I/O)   |
| Unique station addresses (unit Ids)  | 16,000+ (Sixnet) or 247 (Modbus)  |
| Dynamic memory (RAM) (for program execution, dynamic variables, dynamic file system, etc.) | 32bit, 0 wait states<br>16 Megabytes  |
| Program memory (Flash) (programs and file system)  | 16 Megabytes  |
| Datalogging memory (RAM)<br>(for datalogging and retained variables)                       | Battery-backed – Rechargeable Lithium<br>512K bytes (up to 2 Mbytes or more in OEM versions)                                      |
| Battery-backup time / life   | 1 year / 10+ years  |
| Real-time clock resolution   | 10 mS   |
| Real-time clock accuracy   | +/-15 seconds per month   |
| I/O expansion  | SixTRAK, EtherTRAK, RemoteTRAK  |
| Maximum local I/O (via ST-Bus port)  | 1,024 (128 SixTRAK modules) (expander required after every 20 modules)  |
| Maximum distributed I/O (application dependent)  | 50,000+   |
| Datalogging support  | Yes – Sixnet Sixlog   |
| Datalogging modes  | Trending, alarm logging, sequence of events, event initiated, client transfers, and others  |
| Datalogging resolution   | 10 mS   |
| LINUX capabilities   | Practically unlimited (OEM only option)   |
| Programming  | High level C and others   |
| Number of applications allowed   | As many as there is memory for  |
| Available FREE source code   | Practically unlimited   |
| IEC 61131 PLCopen programming  | Yes – Sixnet ISaGRAF  |
| Languages supported  | Ladder logic, function chart, function block, instruction list, structured text, and flow chart                                   |
| Number of programs allowed to be run in IPm  | 1 for ST-GT-####  |
| Cycle time   | 10 mS minimum (user settable)   |
| Communication capabilities   | Master, slave, peer to peer, report on exception, store and forward and more  |
| Communication media supported  | Ethernet, telemetry, telephone (dialup and leased line), radio (dumb and smart), other wireless, fiber optic, short haul and more |
| Redundancy   | Various levels supported  |
| Redundant I/O modules  | Yes – multiple modules can interface to the same I/O; an internal discrete bit reports on-line status of each module              |
| Redundant controllers  | Yes – automatic controller switch-over is supported (user application programming required)                                       |
| Redundant power  | Yes with external diode – automatic switch-over   |
| Backup RS485 communications  | Yes – especially with EtherTRAK modules   |
| Watchdogs and Monitors   | For run-time diagnostics  |
| CPU watchdog   | CPU resets on error; status LED flashes error code  |
| Communications watchdog  | Settable timeout and output action (force off or freeze)  |
| Heartbeat watchdog   | Settable timeout & output action (force off or freeze)  |

|   |  |
|---|--|
| Ethernet Port(s)  | 10/100BaseTx (auto-detecting)  |
| Connection  | RJ45 (auto-crossover)  |
| Isolation   | 1500 Volts RMS 1 minute (60 Hz.)   |
| Message response time (typical)   | 5 mS   |
| Diagnostic LEDs on each port  | Indicates speed, link and activity   |
| Protocols supported   | TCP/IP, ARP, UDP, ICNP, DHCP, Modbus/TCP, Sixnet, and more   |
| Independent networks  | 1 w/ unique MAC & IP address   |
| Network port 1  | 1 shielded RJ45 connector  |
| Serial Ports  | 300 to 115,200 baud  |
| RS232 Port (Port B)   | RJ45 (TD, RD, CTS, RTS, CD, DTR, DSR/RI, GND)  |
| RS485 Port (Port C)   | Screws (GND, 485+, 485-, term.) (2-wire half-duplex)   |
| RS485 network   | Up to 32 (full-load) stations  |
| RS485 distance  | Up to 0.5 miles (1 km)   |
| Protocols (master & slave)  | Sixnet & Modbus (RTU and ASCII)  |
| Diagnostic LEDs on each port  | Transmit Data (TD) & Receive Data (RD)   |
| Flow Control  | Hardware, software, RTS-party (for radios and RS485)   |
| ST-BUS (local I/O) port   | Full line of analog and discrete I/O   |
| Modules   | Up to 128 (including expanders)  |
| I/O channels  | Up to 1,024  |
| Scan time   | 5 mS minimum (varies depending on quantity and type of I/O modules)  |
| Benchmark 1: 48 discretes and 8 analog  | 10 mS  |
| Benchmark 2: 512 discretes  | 30 mS  |
| Benchmark 3: 128 analogs  | 40 mS  |
| Benchmark 3: 512 discretes and 128 analogs  | 80 mS  |
| Cable length (wiring configurations)  | 50 ft. (16 m.) (Daisy-chain or star)   |
| Cable type required   | 2 individually shielded pairs, 22 AWG min.   |
| I/O Tool Kit Windows Software   | Level 1 provided free with all systems   |
| Operating systems   | 95, 98, ME, NT, 2000, and XP   |
| Minimum system requirements   | Pentium or equivalent, 32 Mb RAM, 100 Mb req.  |
| Option 1 (Basic)  | Configuration, calibration, diagnostics, and limited exporting of I/O tags   |
| Option 2 (SCS)  | Full importing and exporting of I/O definitions, peer to peer I/O transfers, and the IOMap shared database.  |
| Option 3 (Datalogging)  | Datalogging capability and quick load feature "Load All".  |
| Environmental   | DIN rail or flat panel mount   |
| Input voltage   | 10-30 VDC (integrated switching supply),<br>(External AC/DC or DC/DC supplies optional)  |
| Input power (@ 24 VDC unless otherwise noted) (+/-10%)<br>(Note: The power consumption variations mostly depend on the number of Ethernet and/or serial connections.) | 2.5W (105mA) – typical (no communications)<br>2.9W (122mA) – typical (all ports communicating)<br>(rated current at max. voltage 30 VDC is 100 mA) |
| Temperature   | -40 to 70°C (-40 to 85°C storage)  |
| Humidity  | 5% to 95% RH (non-condensing)<br>(optional conformal coating)  |
| Flammability  | UL 94V-0 materials   |
| Electrical Safety   | UL 508, CSA C22.2/14; EN61010-1 (IEC1010); CE  |
| EMI emissions   | FCC part 15, ICES-003; EN55022; EN61326-1; CE  |
| EMC immunity  | EN61326-1 (EN61000-4-2,3,4,6); CE  |
| Surge withstand   | IEEE-472 (ANSI C37.90); EN61000-4-2,4  |
| Vibration   | IEC68-2-6  |
| Hazardous locations (Class 1, Div 2, Groups A,B,C,D)  | UL 1604, CSA C22.2/213; Cenelec EN50021 Zone 2   |
| Marine & Offshore   | DNV (Det Norske Veritas)   |
| Packaging   | Aluminum cover (iridite finish) on Lexan base  |
| Mounting  | DIN rail (EN50022) or direct to panel  |



## Section 6

## Maintenance Information

### Local Diagnostics

Local diagnostics can be performed through any available port while the controller / RTU is responding to messages from the other port. Diagnostic software, such as the Sixnet I/O Tool Kit, can be used to display the status of the I/O registers. Refer to the software's on-line help for details.

### Status LED

The "Status" LED on the controller / RTU indicates its operational status:

#### ON

The controller / RTU is operating properly.

#### OFF

There is no power to the controller / RTU or service is required. Contact Sixnet technical support.

#### FAST BLINK

This may occur when the controller / RTU is being reset, or firmware is to be downloaded from the I/O Tool Kit software.

#### SLOW or PERIODIC BLINK

This indicates that the internal watchdog has detected a problem. Try clearing the memory and reloading the project from the I/O Tool Kit.

### Controller or RTU Memory

These Sixnet controllers and RTUs have nonvolatile (battery-free) memory for storing configuration data from the I/O Tool Kit utility.

They also have battery-backed memory for storage of program variables and logged data. The battery is a rechargeable lithium cell that is kept fresh by the power circuitry in the controller or RTU. The memory retention period for an unpowered controller / RTU is at least 6-months at room temperature. The retention time will be shorter at higher temperatures. The life expectancy of the lithium battery is approximately 10 years or more.

### Product Support

To obtain support for Sixnet products, call Sixnet and ask for Applications Engineering. Our phone numbers are:

Phone: +1 (518) 877-5173

Fax: +1 (518) 877-8346

E-mail: [support@sixnet.com](mailto:support@sixnet.com)

Visit us on the Web: [www.sixnet.com](http://www.sixnet.com)

Our mailing address:

**Sixnet Technology Park**

331 Ushers Road

Ballston Lake, NY 12019

## Section 7

## Service Information

### Warranty Information

The warranty for Sixnet products is stated previously in this manual.

### Service Information

We sincerely hope that you never experience a problem with any Sixnet product. If you do need service, call Sixnet at (518) 877-5173 and ask for Applications Engineering. A trained specialist will help you to quickly determine the source of the problem. Many problems are easily resolved with a single phone call. If it is necessary to return a unit to us, an RMA (Return Material Authorization) number will be given to you.

Sixnet tracks the flow of returned material with our RMA system to ensure speedy service. You must include this RMA number on the outside of the box so that your return can be processed immediately.

The applications engineer you are speaking with will fill out an RMA request for you. If the unit has a serial number, we will not need detailed financial information. Otherwise, be sure to have your original purchase order number and date purchased available.

We suggest that you give us a repair purchase order number in case the repair is not covered under our warranty. You will not be billed if the repair is covered under warranty.

Please supply us with as many details about the problem as you can. The information you supply will be written on the RMA form and supplied to the repair department before your unit arrives. This helps us to provide you with the best service, in the fastest manner. Normally, repairs are completed in two days. Sometimes difficult problems take a little longer to solve.

If you need a quicker turnaround, ship the unit to us by air freight. We give priority service to equipment that arrives by overnight delivery. Many repairs received by mid-morning (typical overnight delivery) can be finished the same day and returned immediately.

We apologize for any inconvenience that the need for repair may cause you. We hope that our rapid service meets your needs. If you have any suggestions to help us improve our service, please give us a call. We appreciate your ideas and will respond to them.

#### **For Your Convenience:**

Please fill in the following and keep this manual with your Sixnet system for future reference:

P.O. #: \_\_\_\_\_ Date Purchased: \_\_\_\_\_

Purchased From: \_\_\_\_\_